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10/750,128	12/31/2003	Niniane Wang	24207-10093	9784

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GOOGLE / FENWICK
SILICON VALLEY CENTER
801 CALIFORNIA ST.
MOUNTAIN VIEW, CA 94041

EXAMINER	
SCIACCA, SCOTT M	
ART UNIT	**PAPER NUMBER**
2146	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/750,128	WANG ET AL.	
	Examiner	Art Unit	
	Scott M. Sciacca	2146	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date *10/18/2004,12/8/2006*.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-15, 17-30 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Silberschatz (Operating System Concepts).

Regarding Claim 1, Silberschatz teaches a method comprising:

receiving an operating parameter of a client device (*"The CPU scheduler goes around the ready queue, allocating the CPU to each process for a time interval of up to 1 time quantum"* – See p. 163, section 6.3.4 Round-Robin Scheduling, paragraph 1; The CPU scheduler monitors the ready queue (operating parameter) of processes waiting to be executed);

assigning a value to a usage variable associated with the operating parameter of the client device (*"A time quantum is generally from 10 to 100 milliseconds"* – See p. 163, section 6.3.4 Round-Robin Scheduling, paragraph 1; *"If we use a time quantum of 4 milliseconds, then process P_1 gets the first 4 milliseconds"* – See p. 163, section 6.3.4 Round-Robin Scheduling, paragraph 5; The time quantum (usage variable) is assigned a value of 4 milliseconds in this example); and

correlating by an application a resource usage level of the application with the usage variable (*"A system therefore consists of a collection of processes: Operating-*

system processes executing system code, and user processes executing user code" – See p. 95, paragraph 2; *"If we use a time quantum of 4 milliseconds, then process P_1 gets the first 4 milliseconds. Since it requires another 20 milliseconds, it is preempted after the first time quantum, and the CPU is given to the next process in the queue, process P_2. Since process P_2 does not need 4 milliseconds, it quits before its time quantum expires. The CPU is then given to the next process, process P_3. Once each process has received 1 time quantum, the CPU is returned to process P_1 for an additional time quantum."* – See p. 163, Section 6.3.4, paragraph 5; The operating system (application) which is comprised of a plurality of operating system processes correlates burst times (resource usage levels) of each process with a time quantum (usage variable) by allocating the CPU to each process according to the Round-Robin scheduling algorithm).

Regarding Claim 2, Silberschatz teaches correlating by the application the resource usage level of the application with the usage variable comprising suspending one or more operations when the usage variable exceeds a threshold (*"If a process' CPU burst exceeds 1 time quantum, that process is preempted and is put back in the ready queue"* – See p. 164, paragraph 1).

Regarding Claim 3, Silberschatz teaches correlating by the application the resource usage level of the application with the usage variable comprising performing an activity affecting a usage variable proximate to a time that the usage variable

indicates an existing activity (*"For a multiprogramming system with many processes, the disk queue may often have several pending requests. Thus, when one request is completed, the operating system chooses which pending request to service next"* – See p. 493, paragraph 2).

Regarding Claim 4, Silberschatz teaches correlating by the application the resource usage level of the application with the usage variable comprising adjusting a rate of operation based at least in part on the usage variable (*"If there are n processes in the ready queue and the time quantum is q, then each process gets 1/n of the CPU time in chunks of at most q time units"* – See p. 164, paragraph 2).

Regarding Claim 5, Silberschatz teaches correlating by an application the resource usage level of the application with the usage variable comprising adjusting a sequence of operations based at least in part on the usage variable (*"If we use a time quantum of 4 milliseconds, then process* P_1 *gets the first 4 milliseconds. Since it requires another 20 milliseconds, it is preempted after the first time quantum, and the CPU is given to the next process in the queue, process* P_2*. Since process* P_2 *does not need 4 milliseconds, it quits before its time quantum expires. The CPU is then given to the next process, process* P_3*. Once each process has received 1 time quantum, the CPU is returned to process* P_1 *for an additional time quantum."* – See p. 163, Section 6.3.4, paragraph 5).

Regarding Claim 6, Silberschatz teaches correlating by the application the resource usage level of the application with the usage variable comprising adjusting an active feature based at least in part on the usage variable (*"If a process' CPU burst exceeds 1 time quantum, that process is preempted and is put back in the ready queue"* – See p. 164, paragraph 1; The active process is adjusted by preempting the process when its CPU burst has exceeded one time quantum).

Regarding Claim 7, Silberschatz teaches the client device comprising a client processor and a client memory storage device (See p. 28, Figure 2.1).

Regarding Claim 8, Silberschatz teaches receiving the operating parameter comprising monitoring the operating parameter (*"To implement RR scheduling, we keep the ready queue as a FIFO queue of processes. New processes are added to the tail of the queue. The CPU scheduler picks the first process from the ready queue, sets a time to interrupt after 1 time quantum, and dispatches the process"* – See p. 163, Section 6.3.4, paragraph 2; The ready queue (operating parameter) is monitored for the next process in line for execution).

Regarding Claim 9, Silberschatz teaches monitoring a period of inactivity of the client device (*"CPU scheduling decisions may take place under the following four circumstances: 1. When a process switches from the running state to the waiting state (for example, I/O request, or invocations of wait for the termination of one or the child*

processes" – See p. 153, Section 6.1.3 Preemptive Scheduling; The operating system monitors processes to determine if they enter a wait (inactive) state).

Regarding Claim 10, Silberschatz teaches receiving the operating parameter comprising receiving the operating parameter during an initial load of the client processor (*"Consider the following set of processes that arrive at time 0, with the length of the CPU-burst given in milliseconds"* – See p. 163, paragraph 5).

Regarding Claim 11, Silberschatz teaches receiving the operating parameter comprising receiving the operating parameter during a predetermined time interval (*"The CPU scheduler goes around the ready queue, allocating the CPU to each process for a time interval of up to 1 time quantum"* – See p. 163, section 6.3.4 Round-Robin Scheduling, paragraph 1; *"If we use a time quantum of 4 milliseconds, then process P_1 gets the first 4 milliseconds"* – See p. 163, section 6.3.4 Round-Robin Scheduling, paragraph 5; At the end of each 4 millisecond time quantum the ready queue (operating parameter) is examined in order to determine the next process that the CPU will be allocated to).

Regarding Claim 12, Silberschatz teaches the operating parameter comprising a client processor load (*"The ready queue is treated as a circular queue. The CPU scheduler goes around the ready queue, allocating the CPU to each process for a time interval of up to 1 time quantum"* – See p. 163, section 6.3.4 Round-Robin Scheduling,

paragraph 1; The number of processes contending for CPU processing time comprises the load on the CPU and the ready queue tracks all of those processes which are waiting for the CPU to be allocated to them).

Regarding Claim 13, Silberschatz teaches the period of inactivity comprising a first time and a second time, the second time greater than the first time (See p. 152, Figure 6.1 which shows a plurality of "wait for I/O" states, the second "wait for I/O" state occurring at a later point in time than the first).

Regarding Claim 14, Silberschatz teaches the method of Claim 13 further comprising correlating the resource usage level with the second time (*"CPU scheduling decisions may take place under the following four circumstances: 1. When a process switches from the running state to the waiting state (for example, I/O request, or invocations of wait for the termination of one or the child processes"* – See p. 153, Section 6.1.3 Preemptive Scheduling).

Regarding Claim 15, Silberschatz teaches writing to a computer readable medium of the client memory storage device (*"Therefore, any instructions in execution, and any data being used by the instructions, must be in one of these direct-access storage devices. If the data are not in memory, they must be moved there before the CPU can operate on them"* – See p. 35, Section 2.3.1 Main Memory, paragraph 2; The

instructions which are executed by the CPU of the client device in order to carry out the method of Claim 7 are stored (written) in the memory of the client device).

Regarding Claim 17, Silberschatz teaches a computer readable medium comprising instructions, that, when executed, cause an application to perform the steps of:

receiving an operating parameter of a client device (*"The CPU scheduler goes around the ready queue, allocating the CPU to each process for a time interval of up to 1 time quantum"* – See p. 163, section 6.3.4 Round-Robin Scheduling, paragraph 1; The CPU scheduler monitors the ready queue (operating parameter) of processes waiting to be executed);

assigning a value to a usage variable associated with the operating parameter of the client device (*"A time quantum is generally from 10 to 100 milliseconds"* – See p. 163, section 6.3.4 Round-Robin Scheduling, paragraph 1; *"If we use a time quantum of 4 milliseconds, then process P_1 gets the first 4 milliseconds"* – See p. 163, section 6.3.4 Round-Robin Scheduling, paragraph 5; The time quantum (usage variable) is assigned a value of 4 milliseconds in this example); and

correlating a resource usage level of the application with the usage variable (*"A system therefore consists of a collection of processes: Operating-system processes executing system code, and user processes executing user code"* – See p. 95, paragraph 2; *"If we use a time quantum of 4 milliseconds, then process P_1 gets the first 4 milliseconds. Since it requires another 20 milliseconds, it is preempted after the first*

time quantum, and the CPU is given to the next process in the queue, process P_2. Since process P_2 does not need 4 milliseconds, it quits before its time quantum expires. The CPU is then given to the next process, process P_3. Once each process has received 1 time quantum, the CPU is returned to process P_1 for an additional time quantum." – See p. 163, Section 6.3.4, paragraph 5; The operating system (application) which is comprised of a plurality of operating system processes correlates burst times (resource usage levels) of each process with a time quantum (usage variable) by allocating the CPU to each process according to the Round-Robin scheduling algorithm).

Regarding Claim 18, Silberschatz teaches correlating the resource usage level of the application with the usage variable comprising suspending one or more operations when the usage variable exceeds a threshold (*"If a process' CPU burst exceeds 1 time quantum, that process is preempted and is put back in the ready queue"* – See p. 164, paragraph 1).

Regarding Claim 19, Silberschatz teaches correlating the resource usage level of the application with the usage variable comprising performing an activity affecting a usage variable proximate to a time that the usage variable indicates an existing activity (*"For a multiprogramming system with many processes, the disk queue may often have several pending requests. Thus, when one request is completed, the operating system chooses which pending request to service next"* – See p. 493, paragraph 2).

Regarding Claim 20, Silberschatz teaches correlating the resource usage level of the application with the usage variable comprising adjusting a rate of operation based at least in part on the usage variable (*"If there are n processes in the ready queue and the time quantum is q, then each process gets 1/n of the CPU time in chunks of at most q time units"* – See p. 164, paragraph 2).

Regarding Claim 21, Silberschatz teaches correlating the resource usage level of the application with the usage variable comprising adjusting a sequence of operations based at least in part on the usage variable (*"If we use a time quantum of 4 milliseconds, then process P_1 gets the first 4 milliseconds. Since it requires another 20 milliseconds, it is preempted after the first time quantum, and the CPU is given to the next process in the queue, process P_2. Since process P_2 does not need 4 milliseconds, it quits before its time quantum expires. The CPU is then given to the next process, process P_3. Once each process has received 1 time quantum, the CPU is returned to process P_1 for an additional time quantum."* – See p. 163, Section 6.3.4, paragraph 5).

Regarding Claim 22, Silberschatz teaches correlating the resource usage level of the application with the usage variable comprising adjusting an active feature based at least in part on the usage variable (*"If a process' CPU burst exceeds 1 time quantum, that process is preempted and is put back in the ready queue"* – See p. 164, paragraph

1; The active process is adjusted by preempting the process when its CPU burst has exceeded one time quantum).

Regarding Claim 23, Silberschatz teaches the client device comprising a client processor and a client memory storage device (See p. 28, Figure 2.1).

Regarding Claim 24, Silberschatz teaches the computer readable medium of Claim 17 further comprising instructions that, when executed, cause the application to perform the step of monitoring a period of inactivity of the client device (*"CPU scheduling decisions may take place under the following four circumstances: 1. When a process switches from the running state to the waiting state (for example, I/O request, or invocations of wait for the termination of one or the child processes"* – See p. 153, Section 6.1.3 Preemptive Scheduling; The operating system monitors processes to determine if they enter a wait (inactive) state).

Regarding Claim 25, Silberschatz teaches receiving the operating parameter comprising receiving the operating parameter during an initial load of the client processor (*"Consider the following set of processes that arrive at time 0, with the length of the CPU-burst given in milliseconds"* – See p. 163, paragraph 5).

Regarding Claim 26, Silberschatz teaches receiving the operating parameter comprising receiving the operating parameter during a predetermined time interval

(*"The CPU scheduler goes around the ready queue, allocating the CPU to each process for a time interval of up to 1 time quantum"* – See p. 163, section 6.3.4 Round-Robin Scheduling, paragraph 1; *"If we use a time quantum of 4 milliseconds, then process P_1 gets the first 4 milliseconds"* – See p. 163, section 6.3.4 Round-Robin Scheduling, paragraph 5; At the end of each 4 millisecond time quantum the ready queue (operating parameter) is examined in order to determine the next process that the CPU will be allocated to).

Regarding Claim 27, Silberschatz teaches the operating parameter comprising a client processor load (*"The ready queue is treated as a circular queue. The CPU scheduler goes around the ready queue, allocating the CPU to each process for a time interval of up to 1 time quantum"* – See p. 163, section 6.3.4 Round-Robin Scheduling, paragraph 1; The number of processes contending for CPU processing time comprises the load on the CPU and the ready queue tracks all of those processes which are waiting for the CPU to be allocated to them).

Regarding Claim 28, Silberschatz teaches the period of inactivity comprising a first time and a second time, the second time greater than the first time (See p. 152, Figure 6.1 which shows a plurality of "wait for I/O" states, the second "wait for I/O" state occurring at a later point in time than the first).

Regarding Claim 29, Silberschatz teaches the computer readable medium of Claim 18 further comprising instructions that, when executed, cause the application to perform the step of correlating the resource usage level with the second time (*"CPU scheduling decisions may take place under the following four circumstances: 1. When a process switches from the running state to the waiting state (for example, I/O request, or invocations of wait for the termination of one or the child processes"* – See p. 153, Section 6.1.3 Preemptive Scheduling).

Regarding Claim 30, Silberschatz teaches the computer readable medium of Claim 23 further comprising instructions that, when executed, cause the application to perform the step of writing to a computer readable medium of the client memory storage device (*"Therefore, any instructions in execution, and any data being used by the instructions, must be in one of these direct-access storage devices. If the data are not in memory, they must be moved there before the CPU can operate on them"* – See p. 35, Section 2.3.1 Main Memory, paragraph 2; The instructions which are executed by the CPU of the client device in order to carry out the method of Claim 7 are stored (written) in the memory of the client device).

Regarding Claim 32, Silberschatz teaches receiving the operating parameter comprising monitoring the operating parameter (*"To implement RR scheduling, we keep the ready queue as a FIFO queue of processes. New processes are added to the tail of the queue. The CPU scheduler picks the first process from the ready queue, sets a*

time to interrupt after 1 time quantum, and dispatches the process" – See p. 163, Section 6.3.4, paragraph 2; The ready queue (operating parameter) is monitored for the next process in line for execution).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 16 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silberschatz (Operating System Concepts) as applied to Claims 10 and 25 above, and further in view of Jackson et al. (US 2002/0152305).

Regarding Claims 16 and 31, Silberschatz does not explicitly teach the operating parameter comprising a first parameter and a second parameter, wherein the first parameter comprises a speed of the client processor and the second parameter comprises a capacity of the client memory storage device. However, Jackson does teach the operating parameter comprising a first parameter and a second parameter, the first parameter comprising a speed of the client processor and the second parameter comprising a capacity of the client memory storage device (*"specific examples of information system characteristics that may be so configured for a content delivery system include, but are not limited to, storage characteristics (e.g., <u>storage capacity</u>, mirroring, bandwidth attach rate, protocol, etc.); compute characteristics (e.g.,*

CPU speed, management responsibility, application processing capability, etc.)" – See [0294], lines 18-24). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include processor speed and storage capacity as operating parameters. Motivation for doing so would be to indicate if a system's configuration meets objectives such as anticipated capacity or anticipated throughput (i.e., storage capacity or computing capacity), (See [0294], lines 5-13).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott M. Sciacca whose telephone number is (571) 270-1919. The examiner can normally be reached on Monday thru Friday, 7:30 A.M. - 5:00 P.M. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeff Pwu can be reached on (571) 272-6798. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SS

JEFFREY PWU
SUPERVISORY PATENT EXAMINER